The effect of dentists' body-weight size on student social judgments of dental skill and patients' behavioural intentions: a vignette study.

Abstract:

Where previous work has suggested that over-weight individuals may be subject to negative social judgments, a finding also seen in judgments applied to healthcare professionals (HCPs), this study investigated whether these findings extend to judgments made about dental practitioners.

Methods: A photo of a normal weight male and one of a normal weight female dentist were digitally modified to reliably show them as overweight, giving a total of 4 conditions. In a single-blind quasi-randomized controlled study of 302 undergraduate and postgraduate student participants used a 5 point Likert scale to appraise a single, gender-matched colour photograph as to whether they thought the dentist depicted was competent, professional, caring, had patients' best interests at heart, and was a good dentist. They further rated their future intentions to follow behavioural advice (reduce snacking and take-up flossing) given by the depicted dentist.

Results: The data were analysed using independent sample t-tests. There were no differences in outcomes as a function of the weight status of the depicted dentist in any of the variables explored with the exception of the normal-weight images being rated as more caring than the overweight ones ($p<.04$).

Conclusions: Images of overweight dentists do not receive lower social judgment ratings than images of normal-weight dentists. Previous research in medicine reporting adverse social judgments made of over-weight HCPs does not apply to dental practitioners. Future research should focus on factors that may explain these findings.

Clinical significance: Dentists appear to be protected from the adverse effect of overweight on social judgments of their personal characteristics and on their health-promoting advice.

Key Words: psychology; overweight; obesity; social judgments; professionalism;

Introduction:

The influence of a person's dentition (1) and overall appearance (2) on social judgments has been experimentally investigated before with researchers concluding that an individual's overall level of attractiveness is more important than their dental condition in relation to social judgments (2). Thus irrespective of the presence of caries, digitally modified photos of objectively rated highly attractive faces, were appraised more positively than those of lower attractiveness on outcomes such as popularity, friendliness, intellectual ability and psychological adjustment (2).

Overweight and obesity accounts for 2.8 million adult deaths and is the fifth leading risk for global mortality (3). Obesity is negatively associated with attractiveness (4, 5); additionally, obese individuals are vulnerable to negative stereotypes, including perceptions that they are lazy, lacking in willpower, ill-disciplined and unintelligent (6). Such perceptions often result into stigma, prejudice and discrimination(7).

Obese people are not only judged by society but they are also judged by healthcare professionals (HCPs). For example, a systematic review concluded that HCPs, such as doctors and nurses, possess negative attitudes towards obese patients (8). Similar findings have been reported extensively in other studies of different HCP groups and across a range of clinical settings and countries (9-21).

A large numbers of HCPs are overweight or obese with 300,000 United Kingdom National Health Service (NHS) staff classified obese and a further 400,000 as overweight (22). Just like HCPs appear to hold negative views of their overweight or obese patients, it is reasonable to hypothesize that the patient's perception of a HCP may be influenced by the HCP's body size. Patients have reported higher confidence in advice received from non-overweight doctors (7, 23); similarly a US sample reported higher confidence in normal rather than overweight nurses to provide education about diet and exercise (24). These results have serious implications for the effective delivery of healthcare given that HCPs through their relationships with patients need to be at the forefront of helping individuals change their lifestyles (25).

Whilst the effect of HCPs' weight on patients' perceptions of the HCPs' ability have been explored within a medical context, it is not known whether and to what extent they may be generalised to dental settings. Thus, whilst people have less confidence in the advice from overweight or obese HCPs, it is not known whether the same effects apply to dental practitioners. Dentistry differs from medicine in many respects with up to 25% of the adult population experiencing negative feelings about dentists and dental

visits in the first place (26). Some early work reported a relationship between the gender and ethnicity of a dental health professional and patient views regarding competence, how caring they were and ultimately whether the patient would choose them as their HCP (27). More recently, British people reported a preference for younger (rather than older) and British (rather than Asia)-trained dentists in an online vignette study experimentally manipulating gender, age and dentist ethnicity (28). Within this framework of social judgments, it is important to examine whether people's perceptions of a dentist's competence may be influenced by the dentist's body-weight size.

This study explores social judgments relating to an image of a dentist of different body-weight size (normal weight vs overweight) and their relationship with professional credibility and as a health promotion messenger. The study's research aim was thus to explore whether the body-weight size of a dentist impacts upon people's perceptions of their credibility and their ability to give health promotion messages? We predicted that images of overweight dentists would produce different social judgment ratings than images of normal-weight dentists.

Materials and methods

In an independent group, quasi-randomised single-blind, cross-sectional survey design we investigated the influence of body size (2 levels: participant gender-matched photographs of normal weight-size dentists and photographic images of the same dentists digitally enhanced to appear obese) on the likelihood to follow their oral health advice, competence / professionalism, trust, perception of professional credibility (i.e. whether the dentist has the patient's best interests at heart, whether they are caring, whether they are a good dentist) and attractiveness.

Three hundred and two (N=302) volunteer non-healthcare students (N=166 Politics, N=67 Human Resource Management, N=35 Human Nutrition, N=34 Marketing) from a large London university were recruited. The participants agreed to take part in a study to *'explore how people make decisions about their oral health.*' Data were collected in March 2013 and in accordance with the Helsinki Declaration for studies involving human participants. The study was approved by the university's local research ethics committee (ethics ref: BDM/12/13-42)**.**

In order to obtain reliable materials for the study two images depicting either a normal weight-size male or a normal weight-size female person in their mid – late 40s, wearing a white dental tunic and standing behind a dental chair were used. These images were subsequently digitally modified to produce overweight-size versions of the same people. Photographic enhancement to examine social judgment has been used successfully previously (1, 2, 29-32). The four images were validated by a panel of 40 university staff and students, (33 women, 7 men, 3 non-Caucasians) who independently rated the male and female images as either normal weight-size or overweight-size (male images chi-square=27.14, d.f.=1, p<.001; female images chi-square=37.35, d.f.=1, p<.001). Although the images were modified to the point that they were rated overweight, we did not change the images with a specific BMI in mind, nor did we ask our independent raters to judge the images' BMI given that BMI is difficult to estimate from a visual image (33).

Participants' social judgments were measured using a questionnaire. The constructs assessed were:

- Two items regarding behavioural intention about oral health: how likely they were to floss their teeth at night / only eat sugary foods with their meal (rated on a scale from very likely to very unlikely)

- Six items regarding the dentist's credibility: agreement with statements describing the dentist as competent, professional, caring, someone they could trust, someone who had their best interest at heart, someone who they thought was a good dentist (using a scale from strongly agree to strongly disagree);

One item regarding attractiveness: how attractive was the image in the photo (very unattractive to very attractive on a 5 point Likert scale). The reason for including this variable was to ensure that any differences in the findings between overweight and non-overweight images were not due to changes in the perceived attractiveness of the overweight image.

The items were chosen with brevity in mind but also to measure broad aspects of professional credibility, a simple (flossing) and a complex (diet change) behavioural outcome and an item measuring attractiveness so that it could potentially be statistically co-varied if necessary. Demographic data on the participants' self-reported height and weight, age, gender, nationality and ethnicity were also collected. Self-report height and weight data are easy to collect but have limitations (34).

The true nature of the study was initially carefully concealed with the participants being told that the study examined "*how people make decisions about their oral health"*. They were then randomly allocated to rate either a normal weight-size or overweight-size, gender-matched image of a dentist. Having been given a questionnaire, participants were read a short vignette. The vignette asked them to imagine that the person in the presented photographic image was a dentist with whom they had just registered. During their first visit the dentist in the image was said to have advised them to only eat sugary foods infrequently and only at mealtimes and, having been shown the correct flossing technique, to floss their teeth, especially last thing at night. The participants were told to look at the image and answer the questions that followed relating to the dentist in the image. They were advised to work independently and also to only consider the questionnaire they have been given. Data collection took place at the start or end of a timetabled lecture session and in a lecture theatre / classroom. Participants sat on single chairs with limited space between participants and were supervised throughout. Anonymity and confidentiality were assured and procedures for withdrawal from the study were outlined. All participants were debriefed through a written note justifying the mild deception, fully explaining the nature of the study and explaining data withdrawal procedures.

Cronbach's alpha was used to assess the questionnaire's internal consistency. Descriptive statistics (Mean, Standard Deviation and Confidence Intervals) were calculated followed by parametric two group comparisons to assess differences between responses made to overweight-size and normal size images. Given the robustness of parametric tests over non-parametric equivalents and the ability of the t-test to detect differences even in situations where its assumptions are violated (35), independent group t- tests were conducted.

Results:

Overall the questionnaire was reliable with a Cronbach's $\alpha = 0.797$, improving to $\alpha = 0.841$ if the attractiveness item was removed. The attractiveness item was therefore excluded from further analyses.

Of the N=302 eligible participants who were approached all agreed to participate and none withdrew from the study. Similar numbers of participants were exposed to overweight-size (N=150) and normal weight-size (N=152) images. A CONSORT chart appears in Figure 1.

--------Fig 1 about here ---------

The sample were young (M age 21.28 years, SD=3.48), mainly female (male/female ratio 87/215) and described themselves as being from a White (N=189) followed by an Asian (N=89), Black (N=10) or undisclosed (N=11) background. Just over half the sample were British (N=161) with the remainder (N=137) being of non-British backgrounds. The participants' self-reported weight and height data were used to calculate the sample BMI of 21.48 (range: 14-48, SD=3.92).

The descriptive data are shown in Table 1. Higher scores indicate more positive attitudes/ intended oral health behaviour on a 5-point Likert scale.

--------Table 1 about here ---------

As can be seen from Table 1, all responses across both conditions are very closely centred round the middle of the scale (Likert point 3 : Neither Agree/ Nor Disagree option). The means seen in the normal weight-size dentist condition are slightly higher than those seen in the overweight-size dentist condition (with the exception of the first item relating to the participants' intention to limit their consumption of sugary foods). The confidence intervals appear to heavily overlap between the two conditions across the questionnaire items.

These data were evaluated inferentially through independent sample t-tests comparing normal weight-size image responses to overweight-size image responses. These failed to detect any statistically significant differences between the two conditions in any of the items examined (t range 0.447-1.26, d.f range 271-297, $p>.05$) with the exception of the 'caring' item where the overweight-size images were rated as less caring than the normal weight-size ones [$t(294) = 2.17$, $p <.04$].

The study had 74% power to detect a medium effect size ($d=0.3$) with 95% confidence. All analyses were carried out using SPSS v.20.

Discussion:

The present study aimed to explore the effects of body weight-size on the professional credibility and the perceived ability of dentists to give health promotion messages. The participants were asked to make a social judgment on a gender-matched photographic image of either a normal weight-size or overweight-size dentist in terms of the personal (e.g. caring, trustworthy, has patient's best interests at heart) and professional (competent, professional a good dentist) characteristics of the person. They were also asked to report how likely they would be to follow oral health promotion advice (sugary food consumption reduction and flossing) if it was given by the depicted dentist.

The study found no evidence to suggest that the dentist's body weight-size would have an effect on the social judgments of either the dentist's professional or personal characteristics, although there was a weak trend of the participants to rate the overweight-size images as slightly less caring than the normal weight-size dentists. This could be a true finding that should be explored further or it may simply be the result of Type 1 errors arising from the multiple comparisons examined.

On the basis of these findings, it would appear that, whilst people may be influenced by the HCPs' body weight-size in medical settings (9-21), dentists seem to be treated differently to other HCPs in this respect. There may be several reasons for this.

One explanation may relate to the context within which patients judge their dentist. Thus, given the extensive number of people who are fearful of the dentist (26), it would be reasonable to speculate that patients put a lot of time and resources into choosing their dentist carefully. Here, factors such as the professional status of the dentist, word of mouth about their skills and so on might be important, especially in a health context where unlike other NHS health consultations, a visit to the dentist is associated with financial investment on behalf of the patient. Hence, where the patient has made a conscious *choice* to see a particular dentist and has invested time and financial resources in doing so, they may be less likely to use the dentist's appearance to judge the dentist's professional status or skill. The psychological theory of cognitive dissonance where people seek congruence between their beliefs (i.e. *I would only ever be seen by a good dentist, I am a good judge of character*) and their future behaviours (i.e. *I am a good judge of character, I have chosen to see this dentist, hence this dentist must be a good dentist*)(36) may shed further light to these findings.

A second reason why these findings differ from those seen in mainstream medical settings may relate to dental anxiety. It is well known that about 25% of adults are dentally anxious (26). It may be that dental

anxiety is such an important issue in people's minds that it overshadows any other social judgment of dentists. Thus, it may be that dental anxiety level rather than body weight-size is a better predictor of how people judge dentists, with dentists who manage patients' dental anxiety well being viewed as competent, professional and so on, irrespective of their body weight-size. Future work in this field should include a brief measure of dental anxiety such as the Modified Dental Anxiety Scale (37) in order to assess participants' levels of dental fear that may mask any social judgment effects.

Our study had some limitations. Our student sample was young and well educated so that their judgments may not generalize to older or less well educated groups. Males were under-represented reflecting the gender split of those who choose to study at the university where the sample was recruited from. The use of vignettes, whilst helpful for conducting experimental health psychology studies of this type, is limited in terms of ecological validity. Although there are no validated measures available to test the issues presented here, our scales were reliable as seen in the high Cronbach's alpha but could be subject to further validation. Finally, although the materials used were screened for equivalence, the photographic images were not of pristine quality and should have been assessed to ensure that participants thought that they were realistic.

In summary, these study findings suggest that the dentist's weight-size does not result in the social judgments reported widely in previous work about HCPs in medical settings. The clinical implications of these findings are that, unlike other HCPs, dentists appear to be protected from the well-documented effects of obesity-related judgments routinely made by patients, which potentially affect patient confidence with HCP advice, as reported in the medical field. Our findings would indicate that dentists are in an ideal position to be health promoters and project professional credibility, uninfluenced by patient social judgments relating to the dentist's weight. The reasons behind this observation need to be addressed in future research.

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